

Linear Algebra

Name of the Assistant/Associate Professor: MUKESH YADAV
Class and Section: B.A. \B.Sc. 3rd year (6th Semester)
Subject: Mathematics
Paper: Linear Algebra
JANUARY
Week 1
Chapter: 1-“Vector Spaces”
Assignments:
Week 1, Day 1, 01.01.....: Basic definitions of Vector spaces and its properties
Week 1, Day 2, 02.01.....: Examples of vector spaces
Week 1, Day 3, 03.01.....: some problems related to properties of vector spaces
Week 1, Day 4, 04.01.....: Subspaces of vector spaces and some theorems related to vector subspaces
Week 1, Day 5, 05.01.....: some theorems related to vector subspaces
Week 1, Day 6, 06.01.....: some problems related to properties of subspaces
Week 2
Chapter: 1-“Vector Spaces” and 2-“Basis and Dimension”
Assignments:
Some questions on vector spaces
Week 2, Day 1, 08.01.....: Linear Sum of subspaces with theorems and its solution
Week 2, Day 2, 09.01.....: linear combination of vectors and linear dependence and independence of vectors with theorems
Week 2, Day 3, 10.01.....:some examples and problems on linear dependence and independence of vectors
Week 2, Day 4, 11.01.....: Linear span, finetly generated vector spacewith theorem

Week 2, Day 5, 12.01.....:Examples on linear span,basis vector spaces,ordered basis,coordinates of vector relative to basis
Week 2, Day 6, 13.01.....:Theorems on basis,maximal linearly independent set
Week 3 Chapter2: “Basis and Dimension” and Chapter 3: “Quotient space”
<i>Assignments: Test of vector spaces</i>
Week 3, Day 1, 15.01.....: dimension of a vector spaces,extension theorems
Week 3, Day 2, 16.01.....: Examples and problems on dimension
Week 3, Day 3, 17.01.....: Identical subspaces, theorem(dimension on linear sum) with problems
Week 3, Day 4, 18.01.....: Theorems , dimension of quotient spaces(theorems)
Week 3, Day 5, 19.01.....: Theorems , examples and problems on quotient space
Week 3, Day 6, 20.01.....: Problems related to first three chapters
Week 4 Chapter4: “ Linear Transformations”
<i>Assignments:</i> Questions on vector spaces , dimension and basis
Week 4, Day 1, 22.01.....: Basant Panchami
Week 4, Day 2, 23.01.....: Linear transformation definitions theorem and properties
Week 4, Day 3, 24.01.....: One one linear transformation,vector space isomorphism,equality of linear transformation
Week 4, Day 4, 25.01.....: Examples and problems on one one onto functions
Week 4, Day 5, 26.01.....: Republic Day
Week 4, Day 6, 27.01.....: Determination of T wid examples and problems
Week 5 Chapter5: “Rank and Nullity”
<i>Assignments:</i> Solve some numericals to find T related to linear transformation
Week 5, Day 1, 29.01.....: Null space or Kernel of linear transformation and theorem
Week 5, Day 2, 30.01.....: Range space or Image space of linear transformation and theorems
Week 5, Day 3, 31.01.....:

Rank and Nullity of linear transformation, Theorem(Sylvester's Law)
--

Name of the Assistant/Associate Professor: MUKESH YADAV
Class and Section: B.A. \B.Sc. 3rd year (6th Semester)
Subject:Mathematics
Paper:Linear Algebra
FEBRUARY
Week 1
Chapter5:" Rank and Nullity" and Chapter 6:" Matrix of a linear transformation"
Assignments: Numerical problems on rank and nullity
Week 1, Day 1, 01.02.....: Examples and problems of chapter 5
Week 1, Day 2, 02.02.....: Matrix of linear transformation relative to orderd basis wiTH examples
Week 1, Day 3, 03.02.....: Notation of coordinate vector and related examples
Week 2
Chapter6: "Matrix of linear transformation Chapter7:" Algebra of linear transformation"
Assignments: Question based to find matrix of linear transformation
Week 2, Day 1, 05.02.....: Matrices of identity and zero transformation with problems
Week 2, Day 2, 06.02.....: Change of basis with example and exercise
Week 2, Day 3, 07.02..... Sum of linear transformationsand theorems
Week 2, Day 4, 08.02..... Theorems on last same topic
Week 2, Day 5, 09.02..... Examples and problems to to given topic
Week 2, Day 6, 10.02.....: Test of chapter 5
Week 3
Chapter 8: "Dual Spaces"
Assignments: Numerical problems of chapter 7
Week 3, Day 1, 12.02.....: Vector space all linear transformation and related theorem
Week 3, Day 2, 13.02.....: Daul space and its theorem
Week 3, Day 3, 14.02.....: Solved examples on dual spaces

Week 3, Day 4, 15.02.....: Bidual or double dual of vector spaces and theorem
Week 3, Day 5, 16.02.....: Annihilator and theorems on annihilator
Week 3, Day 6, 17.02..... Annihilator of an annihilator , theorem and related problems
Week 4 Chapter 9: "Eigens values and eigen vectors"
Assignments: Some questions on dual spaces
Week 4, Day 1, 19.02.....: Test of chapter 4 and 6
Week 4, Day 2, 20.02.....: Presentation of first unit
Week 4, Day 3, 21.02.....: Eigen values and eigen vectorsof linear transformation
Week 4, Day 4, 22.02.....: Eigen space,some important theorems
Week 4, Day 5, 23.02.....: Examples to find eigen values and vectors
Week 4, Day 6, 24.02.....: Similar matrices and theorems
Week 5 Chapter 9: "Eigens values and eigen vectors"
Assignments: Some problems related to eigen values and eigen vectors
Week 5, Day 1, 26.02.....: Diagonalisation, Diagonalizable matrix and theorem
Week 5, Day 2, 27.02.....: Numerical examples
Week 5, Day 3, 28.02.....: Solve exercise

Name of the Assistant/Associate Professor: MUKESH YADAV
Class and Section: B.A. \B.Sc. 3 rd year (6 th Semester)
Subject: Mathematics
Paper: Linear Algrbra
MARCH
Week 1
Chapter 9: "Eigens values and eigen vectors"
Week 1, Day 1, 01.03..... Exercise continue
Week 1, Day 2, 02.03..... Minimal Polynomial, Cayley Hamilton theorem
Week 1, Day 3, 03.03..... Theorems and exercise
Week 2
Chapter 10: "Inner product spaces"
Assignments: Problems to find minimal polynomial
Week 2, Day 1, 05.03.....: Introduction ,inner product spaces with examples
Week 2, Day 2, 06.03.....: Properties of Inner product space with examples
Week 2, Day 3, 07.03.....: Norm of a vector, Cauchy Schwarz inequality
Week 2, Day 4, 08.03.....: Triangle inequality and theorems
Week 2, Day 5, 09.03.....: Theorems and examples
Week 2, Day 6, 10.03.....: Theorems and normed linear space
Week 3
Chapter 10 : " Inner product spaces"
Assignments: Properties and examples of Inner product spaces
Week 3, Day 1, 12.03.....: Orthogonal vectors and Orthogonal complement
Week 3, Day 2, 13.03.....: Theorems related to orthogonality
Week 3, Day 3, 14.03.....: Realated examples to Orthogonality
Week 3, Day 4, 15.03.....:

Examples on Orthogonality
Week 3, Day 5, 16.03.....: Orthonormal set and theorem
Week 3, Day 6, 17.03..... Bessel's inequality and theorem
Week 4 Chapter 10 : " Inner product spaces"
Assignments:
Week 4, Day 1, 19.03.....: Test of chapter 7 and 8
Week 4, Day 2, 20.03.....: Discussion of test and related problems
Week 4, Day 3, 21.03.....: Theorems on Bessels inequality
Week 4, Day 4, 22.03.....: Gram Schmidt Orthonormalization process(theorem)
Week 4, Day 5, 23.03.....: Examples on Gram Schmidt Orthonormalization process
Week 4, Day 6, 24.03.....: Some important theorems
Week 5 Chapter 10 : " Inner product spaces"
Assignments: Problems related to inner product spaces
Week 5, Day 1, 26.03.....: Some important theorems
Week 5, Day 2, 27.03.....: Remaining theorems and examples
Week 5, Day 3, 28.03.....: Exercise based on whole chapter
Week 5, Day 4, 29.03.....: MAHAVIR JAYANTI
Week 5, Day 5, 30.03.....: Exercise based on whole chapter
Week 6 Day 6, 31.03.....: Test of half chapter on inner product space

Name of the Assistant/Associate Professor: MUKESH YADAV
Class and Section: B.A. \B.Sc. 3 rd year (6 th Semester)
Subject: Mathematics
Paper: Linear Algebra
APRIL
Week 1
Chapter 11:" Some theorems on linear operators"
Assignments:
Question on Gram Schmidt Orthonormalization process
Week 1, Day 1, 02.04.....:
Introduction of operators adjoint operators ,self adjoint operators, some important concepts
Week 1, Day 2, 03.04.....:
Some theorems on linear operators
Week 1, Day 3, 04.04.....:
Some theorems on linear operators
Week 1, Day 4, 05.04.....:
Some theorems on linear operators
Week 1, Day 5, 06.04.....:
Some theorems on linear operators
Week 1, Day 6, 07.04.....:
Some theorems on linear operators
Week 2
Chapter 11 : " Some theorems on linear operators"
Assignments:
Numerical problems of inner product space from related book
Week 2, Day 1, 09.04.....:
Some theorems on linear operators
Week 2, Day 2, 10.04.....:
Examples on linear operators
Week 2, Day 3, 11.04.....:
Test of full chapter 10
Week 2, Day 4, 12.04.....:
Problems discussion of test
Week 2, Day 5, 13.04.....:
Presentation of question related to inner product space
Week 2, Day 6, 14.04.....:
Problems on linear operator
Week 3
Chapter 11: : " Some theorems on linear operators"

Assignments: Some important definition and theorems on vector spaces
Week 3, Day 1, 16.04.....: Exercise questions of linear operator
Week 3, Day 2, 17.04.....: Exercise questions of linear operator
Week 3, Day 3, 18.04.....: Exercise questions of linear operator
Week 3, Day 4, 19.04.....: Test of chapter 11
Week 3, Day 5, 20.04.....: Problems discussion of test
Week 3, Day 6, 21.04.....: Problems related to whole chapter
Week 4 Chapter: Revision
Assignments: Some important definition and theorems on Linear transformation
Week 4, Day 1, 23.04..... Problems related to whole chapter
Week 4, Day 2, 24.04.....: Revision of first two chapters
Week 4, Day 3, 25.04..... Revision of chapters 3 and 4
Week 4, Day 4, 26.04..... Revision of chapters 5, 6 and 7
Week 4, Day 5, 27.04..... Revision of chapters 8 and 9
Week 4, Day 6, 28.04..... Revision of chapter 10
Week 5 Chapter: Revision
Assignments: Some important definition and theorems on inner product
Week 5, Day 1, 30.04..... Revision of chapter 11

Real and Complex Analysis

Name of Assistant Professor: MUKESH YADAV

Class and Section: B. Sc. III/B.A-III- Semester

Subject: Real and Complex Analysis

Lesson Plan: 18Weeks (from January to April)

Week 1, January 1 to January 7 Chapter 1:
Assignments
Week 1, Day 1, January 1- Definition of Jacobian, Chain rule & Theorems
Week 1, Day 2, January 2- Examples
Week 1, Day 3, January 3- Problems
Week 1, Day 4, January 4 - Revision
Week 1, Day 5, January 5 – Functional Dependence (Non Dependence), Examples
Week 1, Day 6, January 6- Problems
Week 2, January 8 to January 14 Chapter :
Assignments
Week 2, Day 1, January 8- Revision
Week 2, Day 2, January 9 - Test
Week 2, Day 3, January 10 – Definition & Properties of Beta function
Week 2, Day 4, January 11 - Examples
Week 2, Day 5, January 12 – Gamma function, Recurrence formula, relation between Beta and Gamma function
Week 2, Day 6, January 13 - Examples
Week 3, January 15 to January 21 Chapter
Assignments
Week 3, Day 1, January 15 – Duplication formula and Examples

Week 3, Day 2, January 16 - Problems
Week 3, Day 3, January 17 - Discussion
Week 3, Day 4, January 18 – Double integral
Week 3, Day 5, January 19 - Examples
Week 3, Day 6, January 20 - Problems
Week 4, January 22 to January 28
Chapter
Assignments
Week 4, Day 1, January 22 Holiday
Week 4, Day 2, January 23 – Triple Integral
Week 4, Day 3, January 24 Holiday
Week 4, Day 4, January 25- Examples
Week 4, Day 5, January 26 Holiday
Week 4, Day 6, January 27 - Problems
Week 5, January 29 to February 4
Chapter
Assignments
Week 5, Day 1, January 29 - Test
Week 5, Day 2, January 30- Applications of Double & Triple Integral with Examples
Week 5, Day 3, January 31 Holiday
Week 5, Day 4, February 1 – Dirichlet’s Integral, Liouville’s Extension
Week 5, Day 5, February 2 - Examples
Week 5, Day 6, February 3 – Change of order of integration with examples
Week 6, February 5 to February 11
Chapter
Assignments
Week 6, Day 1, February 5 - Problems
Week 6, Day 2, February 6 - Revision
Week 6, Day 3, February 7- Test

Week 6, Day 4, February 8 – Even, Odd & Periodic functions with examples, Trigonometric series, Piecewise Monotonic functions
Week 6, Day 5, February 9 – Definition of Fourier series, determination of Fourier coefficients or Euler's Formula
Week 6, Day 6, February 10 Holiday
Week 7, February 12 to February 18 Chapter
Assignments
Week 7, Day 1, February 12 – Fourier series for Even & Odd functions
Week 7, Day 2, February 13 Holiday
Week 7, Day 3, February 14 – Dirichlet's conditions, Theorems
Week 7, Day 4, February 15 - Examples
Week 7, Day 5, February 16 – Fourier expansion of functions having points of Discontinuity
Week 7, Day 6, February 17
Week 8 February 19 to February 25 Chapter
Assignments
Week 8, Day 1, February 19 -Examples
Week 8, Day 2, February 20 - Revision
Week 8, Day 3, February 21 - Problems
Week 8, Day 4, February 22 – Change of interval, Examples
Week 8, Day 5, February 23 Holiday
Week 8, Day 6, February 24 – Half range series
Week 9, February 26 to March 4 Chapter
Assignments
Week 9, Day 1, February 26 - Examples
Week 9, Day 2, February 27 – Parseval's Identity for Fourier Series
Week 9, Day 3, February 28 Holiday
Week 9, Day 4, March 1 Holiday

Week 9, Day 5, March 2 Holiday
Week 9, Day 6, March 3 Holiday
Week 10, March 5 to March 11 Chapter
Assignments
Week 10, Day 1, March 5 Holiday
Week 10, Day 2, March 6 - Problems
Week 10, Day 3, March 7 – Revision
Week 10, Day 4, March 8 - Test
Week 10, Day 5, March 9 – Explain Stereographic Projection of Complex numbers
Week 10, Day 6, March 10 - Examples
Week 11, March 12 to March 18 Chapter
Assignments
Week 11, Day 1, March 12 – Definition of complex function & limit, continuity of complex functions
Week 11, Day 2, March 13 – Rule of Differentiation, Examples
Week 11, Day 3, March 14 - Problems
Week 11, Day 4, March 15 – Definition of Analytic function, CR equations, Necessary condition of a function to be analytic
Week 11, Day 5, March 16 - Examples
Week 11, Day 6, March 17 – Sufficient condition for a function to be analytic, Examples
Week 12, March 19 to March 25 Chapter
Assignments
Week 12, Day 1, March 19 – CR equations in Polar form
Week 12, Day 2, March 20 – Definition of Harmonic functions, Theorems
Week 12, Day 3, March 21 - Examples
Week 12, Day 4, March 22 - Problems
Week 12, Day 5, March 23 -Holiday

Week 12, Day 6, March 24 – Applications of analytic functions, Examples
Week 13, March 26 to April 1
Chapter
Assignments
Week 13, Day 1, March 26 - Problems
Week 13, Day 2, March 27 – Def. of Multivalued functions, Elementary functions, Exponential function, Properties of Exponential function
Week 13, Day 3, March 28 – Definition & properties of Trigonometric functions Sinz & Cosz, Hyperbolic functions, Logarithmic function
Week 13, Day 4, March 29 Holiday
Week 13, Day 5, March 30- Examples
Week 13, Day 6, March 31 – Mappings: Translation, Rotation & Magnification
Week 14, April 2 to April 8
Chapter
Assignments
Week 14, Day 1, April 2 - Examples
Week 14, Day 2, April 3 – Conformal mappings, Examples
Week 14, Day 3, April 4 – Linear Transformation, Mobious Transformation, Critical Points, Fixed points
Week 14, Day 4, April 5 - Examples
Week 14, Day 5, April 6 – Discussion
Week 14, Day 6, April 7 - Cross Ratio, Inverse points
Week 15, April 9 to April 15
Chapter
Assignments
Week 15, Day 1, April 9 – Examples
Week 15, Day 2, April 10 - Problems
Week 15, Day 3, April 11- Test
Week 15, Day 4, April 12 – Critical Mappings
Week 15, Day 5, April 13 - Examples
Week 15, Day 6, April 14 Holiday

Week 16, April 16 to April 22
Chapter
Assignments
Week 16, Day 1, April 16 - Problems
Week 16, Day 2, April 17 - Revision
Week 16, Day 3, April 18 Holiday
Week 16, Day 4, April 19 - Test
Week 16, Day 5, April 20 - Revision of Unit I
Week 16, Day 6, April 21 - Revision of Unit I
Week 17 April 23 to April 29
Chapter
Assignments
Week 17, Day 1, April 23 - Revision of Unit II
Week 17, Day 2, April 24 - Revision of Unit III
Week 17, Day 3, April 25 - Test
Week 17, Day 4, April 26 - Revision of Unit IV
Week 17, Day 5, April 27 - Revision of Unit IV
Week 17, Day 6, April 28 - Test
Week 18 April 30 to May 6
Chapter
Assignments
Week 18, Day 1, April 30 Holiday

Numerical Analysis

Name of Assistant Professor: MUKESH YADAV

Class and Section: B.SC-/B.A-III (6th Sem)

Subject: Numerical Analysis

Lesson Plan: 18Weeks (from January to April)

Week 1, January 1 to January 7
Chapter 1:
Assignments
Week 1, Day 1, January 1- Introduction of Difference Operator& their relations
Week 1, Day 2, January 2 – Effects & errors in a difference tabular values
Week 1, Day 3, January 3- Examples
Week 1, Day 4, January 4 –Interpolation with equal interval
Week 1, Day 5, January 5 – Examples
Week 1, Day 6, January 6- Revision
Week 2, January 8 to January14
Chapter :
Assignments
Week 2, Day 1, January 8- Newton’s forward interpolation formula
Week 2, Day 2, January 9 – Examples
Week 2, Day 3, January 10 – Newton’s backward interpolation formula
Week 2, Day 4, January 11 – Examples
Week 2, Day 5, January 12 – Examples
Week 2, Day 6, January 13 - Revision
Week 3, January 15 to January 21
Chapter
Assignments
Week 3, Day 1, January 15 – Interpolation with unequal interval.
Week 3, Day 2, January 16- Examples

Week 3, Day 3, January 17 - Reapted
Week 3, Day 4, January 18 - Revision
Week 3, Day 5, January 19 – Newton’s divided difference
Week 3, Day 6, January 20 – Reapted
Week 4, January 22 to January 28
Chapter
Assignments
Week 4, Day 1, January 22 Holiday
Week 4, Day 2, January 23 – Revision
Week 4, Day 3, January 24 Holiday
Week 4, Day 4, January 25- Examples
Week 4, Day 5, January 26 Holiday
Week 4, Day 6, January 27 - Revision
Week 5, January 29 to February4
Chapter
Assignments
Week 5, Day 1, January 29 – Hermite formula
Week 5, Day2, January 30- Examples
Week 5, Day 3, January 31 Holiday
Week 5, Day 4, February 1 – Central differences (Defination)
Week 5, Day 5, February 2 – Gauss forward interpolation.
Week 5, Day 6, February 3 – Examples
Week 6, February 5to February 11
Chapter
Assignments
Week 6, Day 1, February 5 – Gauss backward interpolation formula
Week 6, Day 2, February 6 – Examples
Week 6, Day 3, February 7- Sterling formula
Week 6, Day 4, February 8 – Examples
Week 6, Day 5, February 9 –Bessel formula
Week 6, Day 6, February 10 Holiday

Week 7, February 12 to February 18
Chapter
Assignments
Week 7, Day 1, February 12 –Examples
Week 7, Day 2, February 13 Holiday
Week 7, Day 3, February 14-Reaped
Week 7, Day 4, February 15 Revision Examples
Week 7, Day 5, February 16 –Test-Unit-1
Week 7, Day 6, February 17 - Explain Test of unit 1
Week 8 February 19 to February25
Chapter
Assignments
Week 8, Day 1, February 19 –Probability distribution of random variables
Week 8, Day 2, February 20- Examples
Week 8, Day 3, February 21 – Bionimal distribution. 20 - Revision
Week 8, Day 4, February 22 - Examples
Week 8, Day 5, February 23 Poission’s distribution
Week 8, Day 6, February 24 – Examples
Week 9, February26 to March4
Chapter
Assignments
Week 9, Day 1, February 26 –Normal distribution: Mean, Variance and fitting.
Week 9, Day 2, February 27 – Examples.
Week 9, Day 3, February 28 Holiday
Week 9, Day 4, March 1 Holiday
Week 9, Day 5, March 2 Holiday
Week 9, Day 6, March 3 Holiday
Week 10, March 5 to March11
Chapter
Assignments
Week 10, Day 1, March -5 Test-Unit-2
Week 10, Day 2, March 6 – Explain

Week 10, Day 3, March 7 – Defination of Numerical differenation
Week 10, Day 4, March 8 – Derivative of a function using interpolation formula
Week 10, Day 5, March 9-Examples
Week 10, Day 6, March 10 Revision
Week 11, March 12 to March 18
Chapter
Assignments
Week 11, Day 1, March 12 – Eigen value problem
Week 11, Day2, March 13 – Power method
Week 11, Day 3, March 14 – Jacobi method
Week 11, Day 4, March 15 – Given’s method
Week 11, Day 5, March 16 -Examples
Week 11, Day 6, March 17 – Reapted
Week 12, March 19 to March25
Chapter
Assignments
Week 12, Day 1, March 19 –House-Holder’s method
Week 12, Day 2, March 20 – Examples
Week 12, Day 3, March 21 – Revision
Week 12, Day 4, March 22 – Explain Unit
Week 12, Day 5, March 23 Holiday
Week 12, Day 6, March 24 – QR method
Week 13, March26to April 1
Chapter
Assignments
Week 13, Day 1, March 26 –Examples
Week 13, Day 2, March 27 – Lanczos method
Week 13, Day 3, March 28 – Examples
Week 13, Day 4, March 29 Holiday
Week 13, Day 5, March 30-Revision
Week 13, Day 6, March 31 – Test –Unit -3

Week 14, April 2 to April 8
Chapter
Assignments
Week 14, Day 1, April 2 – Defination of numerical intigeration
Week 14, Day 2, April 3 – Newton’s-cote’s Quadrature formula
Week 14, Day 3, April 4 -Examples
Week 14, Day 4, April 5 – Trapezoidal rule
Week 14, Day 5, April 6 – Examples
Week 14, Day 6, April 7 – Simpson’s one-third and three-eight rule
Week 15, April 9 to April15
Chapter
Assignments
Week15 , Day 1, April 9 –Chebychev formula
Week 15, Day 2, April 10 –Examples
Week 15, Day 3, April 11-Gauss Quadrature formula
Week 15, Day 4, April 12 – Examples
Week 15, Day 5, April 13 – Revision
Week 15, Day 6, April 14 Holiday
Week 16, April 16 to April22
Chapter
Assignments
Week 16, Day 1, April-16-Numerical solution of ordinary differential equation
Week 16, Day 2, April 17 – Single step methods-Picard’s method
Week 16, Day 3, April 18 Holiday
Week 16, Day 4, April 19 – Examples
Week 16, Day 5, April 20 – Taylor;s series method
Week 16, Day 6, April 21 - Examples
Week17 April 23 to April29
Chapter
Assignments
Week17 , Day 1, April 23 – Euler’s method

Week 17, Day 2, April 24 – Runge-Kutta method
Week 17, Day 3, April 25 - Examples
Week 17, Day 4, April 26 – Multiple step method
Week 17, Day 5, April 27 – Predictor-Corrector method
Week 17, Day 6, April 28 – Modified euler’s method Milne-Simpon’s method
Week 18 April 30 to May 6
Chapter
Assignments
Week18 , Day 1, April 30 Holiday